Such a showing is also necessary because zone density pricing is potentially inconsistent with the Commission's long-standing commitment to geographically averaged interexchange rates, and maintaining universal service.[70] A likely consequence of zone density pricing for access services is that interexchange service rates will have to vary based on differences in the LECs' zone pricing. The Commission will therefore want to ensure that the underlying LEC rates have been adequately justified before allowing them to become effective.

Further, to prevent undue rate increases for rural or residential access customers, the Commission should establish a "low density index" for the LEC zone density rates, similar to AT&T's residence index,[71] with

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[70] See, e.g., MTS and WATS Market Structure, 93 F.C.C.2d 241, modified on recon., 48 Fed. Reg. 42,987 (Sept. 21, 1983), modified on further recon., 97 F.C.C.2d 682 (1983) ("Reconsideration Order"), modified on further recon., 97 F.C.C.2d 834 (1984), aff'd in pertinent part sub nom. National Ass'n of Regulatory Util. Comm'ners v. FCC, 737 F.2d 1095 (D.C. Cir. 1984), cert. denied, 469 U.S. 1227 (1985), modified on further recon., 99 F.C.C.2d 708 (1984), modified on further recon., 101 F.C.C.2d 1222 (1985), aff'd on other grounds sub nom. American Tel. & Tel. v. FCC, 832 F.2d 1285 (D.C. Cir. 1987). In the Reconsideration Order, the Commission stated that it would not allow MTS rate deaveraging "without first completing a full policy and impact review of such a fundamental pricing shift." Reconsideration Order, 97 F.C.C.2d at 740; see also Policy and Rules Concerning Rates for Dominant Carriers, 6 FCC Rcd. 665, 679 (1991).

[71] Policy and Rules Concerning Rates for Dominant Carriers, 4 FCC Rcd. 2873, 3053-62 (1989).

a 1 percent upward ceiling. As the Commission determined when it adopted the AT&T index, such an index will help ensure that overall rates for residential customers remain within a zone of reasonableness, and is consistent with the Commission's policies protecting consumer interests.[72] A price cap LEC low density index would likewise help protect rural customers of high cost LECs by forestalling interexchange rate deaveraging.

D. Additional Exogenous Cost Adjustments Should Be Ordered To Maintain Proper Efficiency Incentives.

The NPRM (¶¶ 63-66) also seeks comment on necessary changes to the exogenous cost rules that would improve price cap incentives. Under the price cap plan, exogenous cost changes are an exception to the general rule that cost changes do not affect price cap indices or the incentives they are intended to create.[73] As the Commission recently observed:

> "The concept of incentive regulation is that an administratively simple mechanism of maximum prices, combined with a widened range of allowable profits, will provide encouragement for the carrier to make

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[72] Id. at 3054.

[73] The exogenous cost categories are listed in Section 61.45(d) of the Commission's Rules. In addition, under this rule, the Commission also has the flexibility to "permit or require" other costs to be treated exogenously, if the Commission deems it to be appropriate.

> business decisions as a competitive firm would, in the knowledge that its earnings will in substantial part and over the long term be determined by how effective those decisions are. In deciding whether a cost change should be endogenous or exogenous, we have sought to maintain this incentive."[74]

Indeed, "the touchstone for the Commission in determining whether a change should be afforded exogenous treatment has been consistency with the incentive structure of the price cap plan."[75]

To maintain appropriate efficiency incentives, the Commission should require exogenous cost treatment for: (i) fully amortized equal access network reconfiguration ("EANR") costs; and (ii) costs associated with the sale of exchanges.[76] As shown below, exogenous

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[74] Treatment of Local Exchange Carrier Tariffs Implementing Statement of Financial Accounting Standards, "Employees Accounting for Postretirement Benefits Other Than Pensions", 8 FCC Rcd. 1024, 1032 (1993) ("OPEB Order").

[75] Id. See also Petition for Waiver of the Commission's Rules to Recover Network Depreciation Costs, 9 FCC Rcd. 377, 387 (1992) ("Network Costs Order") ("a major consideration in evaluating whether a particular cost change should be accorded exogenous treatment has been the extent to which exogenous treatment may affect the carriers' incentives").

[76] There is no need, however, to change the rules for computing AT&T's access charge flowthroughs to equalize the treatment of LEC and CAP access rate changes (NPRM, ¶ 86). Competition in the interexchange market (including that for AT&T's price capped services) already adequately assures efficient pricing of those offerings. In all events, the use of CAPs by AT&T is de minimis -- especially for the Basket 1 switched services that remain subject to

(footnote continued on following page)

treatment of these costs will "assure that the price cap formula does not lead to unreasonably high or unreasonably low rates,"[77] and will strengthen "the incentive for efficiency that is a principle goal of price caps."[78]

First, when the Commission adopted the LEC price cap plan, it determined that EANR costs should be treated endogenously because the Commission believed that the risk that the LECs "could willfully or inadvertently shift switched access costs into the equal access category was too great."[79] The Commission also concluded that the BOCs should amortize these costs over an eight-year period ending on December 31, 1993.[80] That ruling,

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(footnote continued from previous page)

price cap regulation. Unless and until this changes, no modification of the rules need be considered.

[77] Network Costs Order, 9 FCC Rcd. at 386, citing OPEB Order, 8 FCC Rcd. at 1031.

[78] OPEB Order, 8 FCC Rcd. at 1031.

[79] LEC Price Cap Order, 5 FCC Rcd. at 6808.

[80] See Petitions for Recovery of Equal Access Costs, Memorandum Opinion and Order, FCC 85-628, released December 9, 1985, recon., 1 FCC Rcd. 434 (1986). That decision emphasized that the BOCs' EANR costs were of an extraordinary nature, and would be restricted to a period of only a few years.

although cast in terms of the BOCs' EANR costs, also applied to other LECs converting to equal access.[81]

The amortization of LEC EANR costs was completed on December 31, 1993, and those costs now have been fully recovered by the LECs. Therefore, the Commission's earlier concern regarding improper cost shifting by the LECs is now moot. The Commission should therefore require that the LECs treat the expiration of the EANR expense amortization as an exogenous cost change, and remove from their PCIs the amounts embedded in those carriers' caps related to EANR expense.

Treating the expiration of EANR amortization exogenously accords fully with the LEC price cap plan's treatment of amortization of other expenses by those carriers. For example, the LEC Price Cap Order found that the expiration of LEC amortizations of depreciation reserve deficiencies should be treated exogenously because that event would have reduced the LECs' rates under rate of return regulation. The Commission concluded that the same result should follow under price cap regulation because "it would be unfair to ratepayers who are now bearing the cost of the amortization program

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[81] See Centel Companies (Petition for Waiver), 2 FCC Rcd. 1486, 1487 (1987).

if rates were not adjusted downward at the end of the program."[82]

The Commission's reasoning there is equally applicable to the LECs' amortizations of non-capitalized EANR costs. Moreover, treating expiration of the EANR amortization as exogenous is otherwise fully consistent with the objectives of the LEC price cap plan.[83] Thus, the portion of unamortized EANR costs that was reflected in the LEC rates when price caps were introduced should now be removed and treated as an exogenous cost.

In addition, the advent of price cap regulation has created new and powerful economic incentives for

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[82] 5 FCC Rcd. at 6808 (¶ 173). In like manner, the Commission found that the LECs' inside wire amortizations should be treated exogenously because those amortizations would have lowered the LECs' rate bases (and, concomitantly, their rates) under rate of return regulation. The Commission concluded that exogenous treatment of that expense under price caps would achieve the same result. See LEC Price Cap Reconsideration Order, 6 FCC Rcd. at 2673-74 (¶ 79).

[83] The LEC Price Cap Order noted that although "under rate of return regulation, the Commission allowed carriers to recover equal access costs, the necessity for this support, at least for the largest LECs, has greatly diminished." 5 FCC Rcd. at 6808 (¶ 180). The Commission nevertheless recognized that the LECs had embedded those expenses in their "going in" rates used to set their initial PCIs. LEC Price Cap Reconsideration Order, 6 FCC Rcd. at 2665-66 (¶ 65). Yet, when evaluating the LECs' historic productivity the Commission staff removed those equal access costs to assure the validity of the productivity calculation. See LEC Price Cap Order, 5 FCC Rcd. at 6887, 6892 (¶¶ 6, 18).

price cap LECs selectively to sell high cost local exchanges in their service territories to other carriers. For example, last year U S WEST alone was granted waivers by the Commission enabling it to sell 68 primarily rural, high cost exchanges to independent LECs.[84] Already this year, several price cap carriers have filed additional waiver requests to implement similar transactions.[85] In all, AT&T estimates that as many as 1,800 high cost exchanges may be offered for sale by price cap LECs in the next few years.[86]

In such transactions, the Commission has pointed out that

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[84] See U S WEST Communications, Inc./Central Utah Telephone, Inc., 9 FCC Rcd. 194 (1993)("Central Utah"); U S WEST Communications, Inc./Triangle Telephone Cooperative Associations, Inc., 9 FCC Rcd. 202 (1993)("Triangle"); U S WEST Communications, Inc./Nemont Telephone Cooperative, Inc., 9 FCC Rcd. 721 (1993)("Nemont").

[85] See, e.g., United Tel. Co. of South Central Kansas, Inc./South Central Tel. Association, Inc./South Central Telecom, of Kiowa, Inc. (Joint Petition for Waiver), DA 94-299, released April 19, 1994; Citizens Utilities Company/GTE Northwest, Inc./GTE California, Inc. (Joint Petition for Waiver), DA 94-350, released April 22, 1994; U S WEST Communications, Inc./Skyline Telecom/South Central Utah Telephone Association, Inc. (Joint Petition for Waiver), DA 94-351, released April 22, 1994.

[86] AT&T Petition for Rulemaking, filed September 3, 1993, pp. 5-6. This estimate is based on AT&T's analysis of the price cap LECs' publicly disclosed plans, as well as confidential discussions with other price cap LECs.

> "[b]ecause [the selling LEC's] price cap indexes were established with these exchanges as part of its network . . . numerous sales of exchanges by [the seller] will most likely significantly alter the network costs that comprise the basis of its price cap indexes."[87]

In apparent recognition of the fact that the consummation of its sales of high cost exchanges would eliminate substantial network costs embedded in its price caps, U S WEST has applied for and was granted leave by the Commission to reduce its indices to reflect those transactions as an exogenous cost change.[88]

Thus, in all cases where the LEC selling a high cost exchange is subject to price cap regulation, the selling carrier should be required to flow through those cost savings directly to its customers through an exogenous change to its PCIs.[89] Treating these cost changes as exogenous will ensure that a LEC's decision to

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[87] See Central Utah, 9 FCC Rcd. at 196 (¶ 18); accord, Triangle, 9 FCC Rcd. at 206 (¶ 25); Nemont, 9 FCC Rcd. at 724 (¶ 25).

[88] See Commission Requirements for Cost Support Material To Be Filed with 1994 Annual Access Tariffs and for Other Cost Support Material, Order, DA 94-256, released March 18, 1994, ¶¶ 19-20.

[89] See 47 C.F.R. § 61.45(d). Cost changes from sales of exchanges are beyond the control of the price cap carrier. They are therefore cost changes of the type which the Commission has previously held "should result in an adjustment to the [LEC's] cap in order to ensure that the price cap formula does not lead to unreasonably high . . . rates." See LEC Price Cap Order, 5 FCC Rcd. at 6807.

sell an exchange is made for appropriate business reasons and not to simply game the regulatory process.[90]

CONCLUSION

As demonstrated above, the LECs continue to retain monopoly control over the local exchange access services upon which IXCs are critically dependent. Against this background, relaxation of the current stringent price cap regulation of Tier 1 LECs in anticipation of competition is not now necessary or appropriate. Instead, the Commission should revise its incentive regulation plan to assure that its objective of just and reasonable rates is achieved, by implementing modifications to the price cap rules (including, in

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[90] The Commission is also correct in its observation (NPRM, ¶ 88) that the sale of high cost exchanges "may permit higher, cost-based rates to be filed by the buyer," thereby further disadvantaging consumers. The Commission should therefore condition its approval of an exchange sale upon an appropriate showing by both parties to the transaction that the sale will not increase access customers' overall charges either via higher access rates or increased subsidy payments.

particular, revisions to the productivity factor and sharing provisions) as described above in AT&T's Comments.

Respectfully submitted,

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APPENDIX A

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Appendix B

DIRECT MODEL FOR DERIVING LEC PRODUCTIVITY UNDER PRICE CAP REGULATION

1. Background

This model derives directly the level of productivity ("X"-factor) that the LECs have actually achieved under price cap regulation from January 1991 through December 1993 – using the LECs' publicly filed data.

This model is substantially less complex than similar direct models of interstate access productivity that were developed to analyze the various LEC price cap plans proposed in CC Docket 87-313. This is because these earlier models either examined prospective time periods and required the use of forecasted demand and costs.[1] Or, if based on historical costs and demand, these models required substantial adjustments to correct for the effects of the many very significant exogenous cost changes that occurred over the 1984-90 period.[2]

Under price caps, LECs have had to file Tariff Review Plans (TRPs) in which they state explicitly their Price Cap Indices (PCIs), Actual Price Indices (APIs), exogenous cost changes (Zs), minutes per line growth (g), and other price cap formula parameters for

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[1] One such model was submitted by AT&T in Appendix A of its Comments on the *Second Further Notice of Proposed Rulemaking* in CC Docket 87-313 filed on June 19, 1989; and updated in Appendix B of its Comments on the *Supplemental Notice of Proposed Rulemaking* in CC Docket 87-313 filed on May 7, 1990.

[2] The Frentrup-Uretsky model described in the Commission's *Supplemental Notice of Proposed Rulemaking* in CC Docket 87-313 released March 12, 1990 is an example of this type of historical-based model. Among the significant exogenous cost changes which required data adjustments were the introduction of subscriber line charges, the detariffing of inside wire, and the transition from frozen SPF to uniform 25% SPF.

each of their price cap baskets. In addition, these LECs generally file ARMIS reports that detail their actual financial performance, *e.g.*, revenues, expenses, taxes, investment and returns, that are segregated by access basket. Thus, using these basket-specific publicly filed data, it is possible to compute directly the actual achieved productivity performance of the price cap LECs – without using extensive subjective estimated or forecasted data. Because the model presented here uses only these publicly filed ARMIS and TRP data, its results can be routinely replicated for any particular time period or reporting price cap LEC.

The model is described in detail in the ensuing paragraphs.

2. Model Description

2.1 Objective

Using filed data, calculate the X-factor that would have produced exactly an 11.25% rate of return (ROR) for the price cap LECs over the period from January 1991 through December 1993.

2.2 Methodology

The methodology followed by the model is the same as followed by a LEC in computing its sharing obligation under price caps. In computing its sharing obligations, a LEC first determines whether its achieved ROR (as reported on its Form 492) exceeds a given sharing threshold. If it does, the LEC then calculates the amount by which its gross revenues would have to be reduced (adjusting for tax effects) for its ROR to be reduced just to that sharing zone's threshold. This amount (or 50% of this amount if the sharing zone threshold in question is the threshold for the 50/50 zone) is then divided by base year revenues "R" to calculate the percent "Z" reduction in the LEC's PCI necessary to effect the sharing.

For economy of computation, the current modeling uses data only from the seven RBOCs.[3] This is because other price cap LECs generally segregate their price cap filing entities into numerous small study areas, and do not make available all of their TRP data in computer-readable format. Thus, it would have been extremely laborious to include them in this analysis. In all events, if each of the non-RBOC price cap LEC holding companies (GTE/Contel, United/Centel, SNET, Rochester and Lincoln) would make their data available in computer-readable format and consolidated across all of their study areas, this productivity analysis could easily be expanded to include the entire price cap LEC industry. Because the RBOCs account for over 80% of total price capped interstate revenues, and because the financial performance of the non-RBOC price cap LECs does not appear to have differed dramatically from that of the RBOCs, incorporation of non-RBOC data into this model is unlikely to produce significantly different results.

2.3 Procedure

Using ARMIS 43-01 data on actual revenues, expenses, taxes, investment, depreciation reserves and return for the interstate access and interexchange categories, calculate the level of LEC revenue that would have produced an average rate of return of 11.25% over the 1/91 to 12/93 period. In addition, use TRP data on the relative level of API to PCI to calculate the amount of revenue that the LEC would actually have collected had it priced its baskets all the way to their PCI caps.

Use the following relationship to calculate the relative change in the PCI necessary to produce LEC revenues just sufficient to earn 11.25% ROR:

$$\frac{PCI_{@11.25\%}}{PCI_{actual}} = \frac{Revenue_{@11.25\%}}{Revenue_{actual}},$$

[3] Because PacTel reports data separately for Pacific Bell and Nevada Bell, the only PacTel data included in this analysis are those reported by Pacific Bell.

where $Revenue_{actual}$ means the revenue that the RBOC would have collected if it priced its baskets to their actual PCI cap. Then solve for $PCI_{@11.25\%}$:

$$PCI_{@11.25\%} = \frac{Revenue_{@11.25\%}}{Revenue_{actual}} * PCI_{actual}$$

After populating the parameters of the PCI formula with the values specified for these parameters in the annual LEC TRPs, solve for the "X" that would produce the required $PCI_{@11.25\%}$ – given that none of the other parameters in the PCI formula change except, perhaps, for the Z-adjustments associated with upper and lower sharing obligations. More specifically, because the "X" in this PCI is being set to yield an average rate of return of 11.25%, most LECs would incur no upper sharing obligations nor be eligible for any lower sharing adjustments. Hence, most sharing Z-adjustments previously contained in the PCI formula disappear.

These calculations were performed simultaneously for each price cap basket, both for each RBOC individually and as a group, and across all price cap tariff periods (1/91-6/91, 7/91-6/92, 7/92-6/93, 7/93-12/93) contained in the overall 1/91 to 12/93 period.[4] In addition, all calculations were performed both using the "Balanced 50/50" plan for common line basket calculations as ordered by the Commission in CC Docket 87-313, and using a "Per Line" plan whereby common line caps are adjusted to remove 100% of the windfall effects from growth in common line minutes per line.

[4] Because both the initial 1/91-6/91 and final 7/93-12/93 tariff periods are only half a year in length, the annual value for base year GNP-PI inflation was reduced by one half, and the percentage productivity performance necessary to offset this inflation was assumed to be half of its actual annual level.

2. Results

Table B.1 displays the RBOC-specific RORs and "Xs" that each RBOC achieved over the 1/91 to 12/93 time period – using "Balanced 50/50" calculations for the common line basket. In addition, the table displays the composite RBOC ROR and "X" that the RBOCs as a group achieved – computed by rolling up the data from the seven holding companies into a single set of data.

These results demonstrate that as a group, the RBOCs earned 12.89% ROR and achieved a composite "X" of 5.97% over the 1/91 to 12/93 period. Individual RBOC performance ranged from a high of 7.61% "X" for Pacific Bell, to a low of 3.48% "X" for NYNEX.[5] Other than for these two extreme performances, the other RBOC "Xs" cluster between 4.37% and 6.72%. The last column of Table B.1 displays the RORs that each RBOC would have earned if it had had to adhere to the composite achieved "X" of 5.97%.

This model also demonstrates that because these seven RBOCs earned an average ROR of 12.89% under price caps over the 1/91 to 12/93 period, the entire price capped LEC industry collected over $2.5 billion more in revenues from their customers than they would have collected had they priced their interstate access and interexchange services only to earn 11.25% ROR.

Table B.2 displays information analogous to what is displayed in Table B.1 – except that calculations in Table B.2 use the "Per Line" formula for the common line basket. As can be seen, the "Xs" required to earn an 11.25% ROR are roughly 0.80% lower than the "Xs" that are required under the "Balanced 50/50" plan. On a RBOC composite basis, the "X" that would have been achieved under the "Per Line" plan is

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[5] These two particular performances are not surprising. Pacific Bell elected the Commission's optional 4.3% productivity hurdle for some of the 1/91 to 12/93 time period, and over the same time period, NYNEX booked several substantial one-time charges against its earnings – which lowered significantly its reported ROR and computed "X". See these Comments, *supra* at pp. 36-37.

5.16%. But of particular note is the result that under the "Balanced 50/50" plan, the standard deviation of individual RBOC RORs is 0.78%. While under the "Per Line" common line formula the equivalent standard deviation is only 0.72%. Thus, empirical evidence bears out what theory suggests: the "Per Line" formula provides LECs with greater earnings stability in the face of varying demand growth than does the "Balanced 50/50" plan. [6]

Table B.3 displays the average ROR that each RBOC would have earned over the 1/91 to 12/93 period under either the actually achieved RBOC composite "X" of 5.97%, as well as under a reduced "X" of 5.47%. As is clear from this table, under an "X" of 5.47%, no RBOC's earnings would have fallen below the lower sharing threshold of 10.25% over this period.[7]

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[6] This result is unsurprising because the "Per Line" formula tracks much more accurately the lines growth process that actually generates common line costs.

[7] But see Appendix C of these Comments, demonstrating that over the 1/91 to 12/93 period, the actual LEC cost of capital averaged 9.93%. This figure is 132 basis points less than the reference ROR of 11.25% for price cap LECs. Even under the actually achieved composite RBOC "X" of 5.97%, no RBOC individually earned less than this actual average cost of capital.

Table B.1

RATES OF RETURN AND PRODUCTIVITY OFFSETS

"Balanced 50/50" Formula for Common Line

Company	Actually Achieved ROR	Actually Achieved "X"*	ROR That Would Have Been Achieved @ Composite "X"
Ameritech	13.78%	6.69%	11.83%
Bell Atlantic	13.43%	6.33%	11.54%
BellSouth	13.48%	6.72%	11.81%
NYNEX	11.68%	3.48%	10.23%
Pacific Telesis	12.98%	7.61%	11.95%
Southwestern Bell	12.11%	4.37%	10.08%
U S West	12.77%	5.84%	11.16%
Composite RBOC	12.89%	5.97%	11.25%
		Standard Deviation Among RBOCs:	0.78%

* The "X" required to produce an average 11.25% ROR over the 1/91 to 12/93 period

Table B.2

RATES OF RETURN AND PRODUCTIVITY OFFSETS

"Per Line" Formula for Common Line

Company	Actually Achieved ROR	Achieved "X" Under "Per Line" Formula*	ROR That Would Have Been Achieved @ Composite "X"
Ameritech	13.78%	5.97%	11.90%
Bell Atlantic	13.43%	5.50%	11.52%
BellSouth	13.48%	5.77%	11.70%
NYNEX	11.68%	2.78%	10.29%
Pacific Telesis	12.98%	6.36%	11.77%
Southwestern Bell	12.11%	3.60%	10.13%
U S West	12.77%	5.11%	11.22%
Composite RBOC	12.89%	5.16%	11.25%
		Standard Deviation Among RBOCs:	0.72%

* The "X" required to produce an average 11.25% ROR over the 1/91 to 12/93 period

Table B.3

RATES OF RETURN @ DIFFERENT "Xs": 1991-93

"Balanced 50/50" Formula for Common Line

Company	ROR That Would Have Been Achieved @ "X" = 5.97%	ROR That Would Have Been Achieved @ "X" = 5.47%
Ameritech	11.83%	12.25%
Bell Atlantic	11.54%	11.94%
BellSouth	11.81%	12.19%
NYNEX	10.23%	10.44%
Pacific Telesis	11.95%	12.17%
Southwestern Bell	10.08%	10.44%
U S West	11.16%	11.51%
Composite RBOC	11.25%	11.65%

Appendix C

SIMPLE MODEL FOR ESTIMATING LEC PRODUCTIVITY

1. Background

The logic underlying this simple model of LEC productivity was first suggested by the Commission in its *Second Further Notice of Proposed Rulemaking* in CC Docket 87-313 released April 17, 1989, paragraph 705; and reiterated in paragraph 151 of the Commission's *Supplemental Notice of Proposed Rulemaking* in CC Docket 87-313 released March 12, 1990. In these analyses, the Commission observed that because LECs generally maintained capital stocks that were 1.5 times their annual revenues, and faced marginal tax rates of, roughly, 40%, each 1% change in a LEC's annual revenues (or costs) would induce a change of 0.4% in its ROR. Inverting this relationship suggests that a 1% change in ROR would require a 2.5% change in annual revenues (or costs). The extent to which a given change in LEC revenues (or costs) translates into a change in the LEC's productivity factor "X," depends slightly on the methodology used to cap common line prices.[8]

2. Rederivation

Because the capital/revenue ratios and marginal tax rates facing the LECs may have changed since the Commission developed this relationship in 1989, and to reflect the "Balanced 50/50" common line capping mechanism adopted by the Commission in 1990, AT&T has rederived the relationship using more recent data. This rederivation, displayed

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[8] Because the "Balanced 50/50" common line formula requires LECs to reduce slightly their per minute common line rates to adjust for growth in minutes per line, a change of 1% in "X" will stimulate slightly more than a 1% increment in common line revenues.

in Table C.1, demonstrates that based on 1992 data, each 1% change in LEC ROR can be associated with a 2.35% change in annual LEC revenues or costs.[9] Because of the adjustments for demand growth that are implicit in the "Balanced 50/50" common line capping formula, each 1% change in LEC revenues (or costs) is equivalent to about a 0.95% change in "X." [10] Thus, this simple analysis suggests that each 1% change in LEC ROR can be associated with a 2.23% change in LEC "X."

2. Results

Over the period from January 1991 through December 1993, data analyzed in Appendix B of these Comments show that the price capped RBOCs earned a composite average return of 12.89%. Because this represents an increase of 1.64% (= 12.89% - 11.25%) over the ROR level associated with achieving an "X" of 3.3%, this simple model for estimating productivity suggests that these LECs achieved an actual "X" that is 3.66% (= 2.23 * 1.64%) higher than their assigned "X" of 3.3%, or 6.96% (= 3.3% + 3.66%).

Because the above model does not take into account ancillary effects on the measurement of LEC productivity such as the segregation of priced capped services into different baskets, multiple tariff periods, under-cap pricing or changes in demand growth rates, this model may be slightly less precise in estimating achieved productivity than the direct model presented in Appendix B of these Comments.[11]

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[9] Because several Tier 1 LECs did not file their 1993 ARMIS reports on the original due date of April 1, 1994, the most recent year for which complete data are available is 1992. In all events, it is extremely unlikely that these ratios would change significantly in one or two years' time.

[10] The precise relation is sensitive to the experienced growth in minutes per line, the share of subscriber line charge revenues in common line, and the share of common line revenues in total interstate revenues.

[11] Indeed, failure to account for under-cap pricing causes this simple model of LEC productivity to underestimate the level of "X" actually achieved by the price capped LECs.

Table C.1

SIMPLE PRODUCTIVITY ANALYSIS

(Dollars in Thousands)

	1992 Tier 1 LEC
Revenues	$20,820,226
Average Net Investment	$31,260,058
Income Tax Rate	36.00%
Tax Gross-up Factor	1.5625
Change in Return Required for 1% Change in ROR	$312,601
Change in Revenues Required for 1% Change in ROR	$488,438
Percent Change in Revenue Required to Change ROR by 1%	2.35%
Increment to "X" Associated With a 1% Change in ROR	2.23%

	1991-93 RBOC
Composite Achieved ROR	12.89%
Excess ROR Over 11.25%	1.64%
Extra Achieved "X"	3.66%
Total Achieved "X"	6.96%

Appendix D

DERIVATION OF THE LECs' WEIGHTED AVERAGE COST OF CAPITAL

1. Background

Part 65 of the Commission's rules prescribes a methodology for computing the weighted average cost of capital to LECs which has been used in the last two rate of return represcriptions undertaken by Commission.

This methodology uses data from the Regional Bell Holding Companies (RBHCs) as surrogates for the entire interstate LEC industry. It consists of three steps. The first is to compute the cost of RBHC equity capital. The second is to compute the cost of RBHC embedded debt. And the third is to combine these into an overall cost of capital, weighted by the relative fractions of debt and equity in the RBHCs' capital structure.

2. Cost Of Equity

2.1 Theory

AT&T estimated the cost of equity capital using the discounted cash flow (DCF) technique described by the Commission in Part 65 of its rules and in its Order on CC Docket 89-624. This approach is based on the proposition that the price of a company's stock equals the present value of future dividends per share discounted by the company's cost of equity capital. If dividends are assumed to grow at a constant rate, the DCF model shows that the market-required return on equity (ROE) equals the sum of the forward looking (expected) dividend yield, and the expected dividend growth rate. This single-growth-rate DCF formula is shown in equation (1) below:

$$K_e = \frac{D}{P} + G \qquad (1)$$

where:

K_e = cost of equity,

D = annual dividend on a share of common stock,

P = price of a share of common stock, and

G = long-term growth rate of expected dividends.

According to this DCF formula, the return investors expect to earn on a share of common stock (K_e) equals the dividend yield they receive from that share (D/P), plus the long-term growth they expect in earnings (G).

2.2 Data

AT&T estimated the average price of a share of common stock, P, for each year from 1991 to 1993 by first computing a stock price for each trading day by averaging that day's high and low price. These daily prices were then averaged over the entire year's set of daily prices to arrive at P.[12]

An additional factor in the DCF formula is the long-term growth investors forecast for the earnings of the company whose cost of equity is being estimated, G. Following the *1990 Represcription Order* in CC Docket 89-624 (5 FCC Rcd at 7515, paras. 67 & 69) and Part 65.303 of the Commission's rules, AT&T used the analysts' median consensus long-term growth estimates published by Institutional Brokers Estimate Service (IBES).[13]

The final factor in the DCF formula is annual dividends, D.[14] To estimate annual dividends, AT&T followed Commission practice by increasing stated annual dividends by one-half of the median IBES dividend growth rate.[15]

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[12] All stock price data were extracted from Standard & Poor's *Compustat* data base.

[13] All data were retrieved from reports produced by IBES, Inc. as of the third Wednesday in January for each year for which data were extracted.

[14] Raw dividend data were extracted from Standard & Poor's *Compustat* data base.